UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

DEC 1 8 2017

REPLY TO THE ATTENTION OF:

LU-16J

Jason Smith
Corporate Environmental Director
Tecumseh Products Company
2700 W. Wood Street
Paris, TN 38242

Re: *Conditional Approval of Revised Corrective Measure Proposal*
Tecumseh Products Company, 100 East Patterson, Tecumseh, Michigan 49286
EPA ID#: MID005049440
AOC RCRA-05-2010-0012

Dear Mr. Smith:

The US EPA has completed a review of the *Revised Corrective Measures Proposal* (CMP), dated March 6, 2017 that TRC prepared on behalf of Tecumseh Products Company (TPC). Based on that review and follow-up discussions with TPC, and in consultation with the MDEQ's Remediation Advisory Team, US EPA conditionally approves the CMP.

Full approval will become effective after TPC revises the performance monitoring plan and duration of monitoring as agreed to by the parties during our September 13, 2017 conference call; a summary of that call was provided to you by electronic mail on the same date and is attached. TPC will include the additional monitoring proposal in the Construction Complete Documentation report, which will be prepared by TPC following EPA's issuance of a Statement of Basis and Final Decision on the proposed cleanup. Once the Final Decision is prepared, construction of the remedy can begin.

A copy of the MDEQ Remediation Advisory Team's notes dated December 8, 2017, summarizing the November 29, 2017 RAT meeting, is attached for your reference.

EPA will provide separate correspondence regarding the September 11, 2017 report titled, *Groundwater-Surface Water Interface Performance Monitoring Plan* .

Thank you for your cooperation and please contact me if you have any questions or concerns.

Sincerely,

Joseph Kelly, Project Manager
Remediation and Reuse Branch

Enclosure

cc: Graham Crockford, Stacy Metz, TRC Environmental Corporation (by email)
Douglas McClure, Conlin, McKenney & Philbrick, PC (by email)
Tecumseh District Library – Public Repository
Eleni Kouimelis, Winston and Strawn LLP (by email)
Joe Victory, Dale Bridgford, MDEQ (by email)

bcc: Susan Perdomo, ORC C-14J
Joseph Kelly, LCD LU-9J
Michael Beedle, LCD LU-9J

Kelly, Joseph

From: Kelly, Joseph
Sent: Wednesday, September 13, 2017 1:23 PM
To: 'GCrockford@trcsolutions.com'; 'SMetz@trcsolutions.com'; 'Jason.Smith@tecumseh.com'; 'Victory, Joseph (DEQ)'
Subject: TPC Performance Monitoring during Corrective Measures
Attachments: Modifications.kmz; Soil Vapor Properties Plume North Area.kmz; Soil Vapor Properties Plume South Area.kmz; New Proposed Monitoring.kmz

Categories: Record Saved - Shared

Jason, Graham, and Stacy

Joe Victory and I have discussed the performance monitoring and screening levels for the volatilization to indoor air pathway (VIAP) at the Tecumseh Products Corporation (TPC) site. MDEQ is still assessing TPC's proposed RBCA Model-based, site-specific screening levels for the VIAP. TCE data for the years 2010-2017 indicate highly variable relationships between groundwater data, soil vapor data, and indoor air data at adjacent (or co-located) monitoring points. In addition, long-term trends in some data cannot be evaluated because incomplete data sets by media/location were collected during the characterization stage of the RFI. As a result, we are suggesting that performance monitoring will need to be achieved through a combination of the groundwater sampling, soil gas sampling, co-located indoor air and sub-slab air monitoring, and O&M monitoring we are proposing herein.

As a result of our discussions, we have outlined the following performance monitoring criteria and objectives, which we would like to discuss. I have attached kmz files for viewing in Google Earth.

PERFORMANCE MONITORING

Groundwater Monitoring requirements:

a. Locations - within the entire current plume footprint, at all source areas, and at sentinel points along the projected plume path. (locations added to those proposed in attached Modifications.kmz file)
b. Frequency - Quarterly
c. Duration - dependent on screening levels (TBD) being met continuously, along with source removal.

After reviewing the modifications in the revised 3/6/17 CMP, your proposed locations for groundwater monitoring are much closer to what I had envisioned. In addition to those locations proposed in the 3/6/2017 CMP, EPA requests the inclusion of performance groundwater monitoring at existing wells PRB-01S, PRB-15D, PRB-16S, MW-17S, MW-21, and MW-41, and has identified the need for monitoring at additional depths at locations proposed in the 3/6/2017 CMP to include MW-44D, MW-48D, MW-49D, MW-51 (include both shallow and deep intervals), MW-52 (include both shallow and deep intervals), MW-61D, MW-62 (include both shallow and deep intervals closer to source), MW-XX (shallow, intermediate and deep intervals at SB-80), MW-YY (deep interval, source areas south of MW-33S, installed east of source), and MW-ZZI (intermediate depth along Maumee, between Cummins and Patterson. These are shown on the attached Modifications.kmz file, compared with the locations proposed in the 3/6/16 CMP (New Proposed Monitoring.kmz).

Indoor Air requirements - sampling is the only line of evidence that can confirm a complete VI pathway at a given location:

a. Location –
    i. Where an SSDS is in operation (at less frequency than where no SSDS is present)

ii. Where a HVAC or other engineering control is mitigating risk (at less frequency than where no engineering control is present)
iii. Within the 100-ft lateral inclusion zone – At residential or commercial locations where adjacent plume concentrations are at 10x the screening level, a preferential pathway is known to exist, or where a resident requests monitoring (potentially affected locations are shown in the attached Soil Vapor Properties Plume North Area and Soil Vapor Properties Plume South Area kmz files; EPA proposes half of those locations should be sampled).
iv. Ideally co-located with sub-slab soil gas points and/or occupied areas for commercial buildings. Sample each occupied level of building that has potential for exposure.

b. frequency –
   i. Conduct annually within the entire current plume footprint, and at sentinel points along the projected plume path
   ii. Reduce based on SG/GW detections below MSSLs (default or site-specific) – confirming validation of model(s)
   iii. If indoor air detections > ND < RIASLs - Start with quarterly monitoring, frequency is increased to monthly if increasing trends, or post-evacuation (during SSDS Startup)

c. Duration - contingent upon ND results and engineering controls functionality OR source removal

EPA identifies approximately 20 residential properties and 17 commercial/commercial properties within the footprint of the shallow groundwater plume. EPA and MDEQ believe that co-located soil vapor and indoor air sampling should be performed at a representative portion of these properties, with a goal of targeting 50% of the potentially affected locations during remediation.

Soil Gas requirements - sampling should ideally be conducted at sub-slab locations; however, access considerations and other pathways into structures (utilities, etc.) must be considered (additional soil gas locations proposed in attached Modifications.kmz file).

a. Locations –
   i. Within the entire current plume footprint where receptors are present.
   ii. Where an SSDS is in operation
   iii. Within the 100-ft lateral inclusion zone – At residential or commercial locations adjacent to the source
   iv. Ideally co-located with sub-slab soil gas points and/or occupied areas for commercial buildings. Sample each occupied level of building that has potential for exposure
b. Frequency – Quarterly to semi-annually along with groundwater monitoring in plume footprint interior
c. Duration - contingent upon ND results and engineering controls functionality OR source removal

In addition to those locations proposed in the 3/6/2017 CMP, EPA requests the inclusion of performance soil gas monitoring at existing locations SG-01, SG-02, SG-03R, SG-05, SG-08, SG-13, SG-14R, SG-28. EPA proposes the installation of a new soil gas location (or collocated vapor pin/indoor air location) at SG-XX, at the property where MW-50 is proposed. EPA also requests the potential reinstallation of SG-06R, given that the soil gas results appear inconsistent with groundwater data from this area, to determine if the existing location is isolated from subsurface contamination by a subsurface anomaly.

Engineering Controls – O&M Schedule for HVAC, SSDS, SVE at source, or other control

a. HVAC adjustments (filter changeouts, damper settings changes, etc) – as indoor air concentrations increase, or as needed
b. SSDS operation verification via pressure differential monitoring, stack testing– semi-annually-assuming the plume is decreasing in strength

c. Reduce frequency when pressure differential monitoring consistently shows positive pressure conditions
d. Screening levels consistently met in applicable media

We can discuss these further on Sept 21. If possible, we should begin planning on presenting at the RAT meeting in October, if that works for your schedule.

Regards,

Joseph C. Kelly, P.G.
Corrective Action Project Manager
Remediation and Reuse Branch
U.S. EPA Region 5
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Chicago, Illinois 60604
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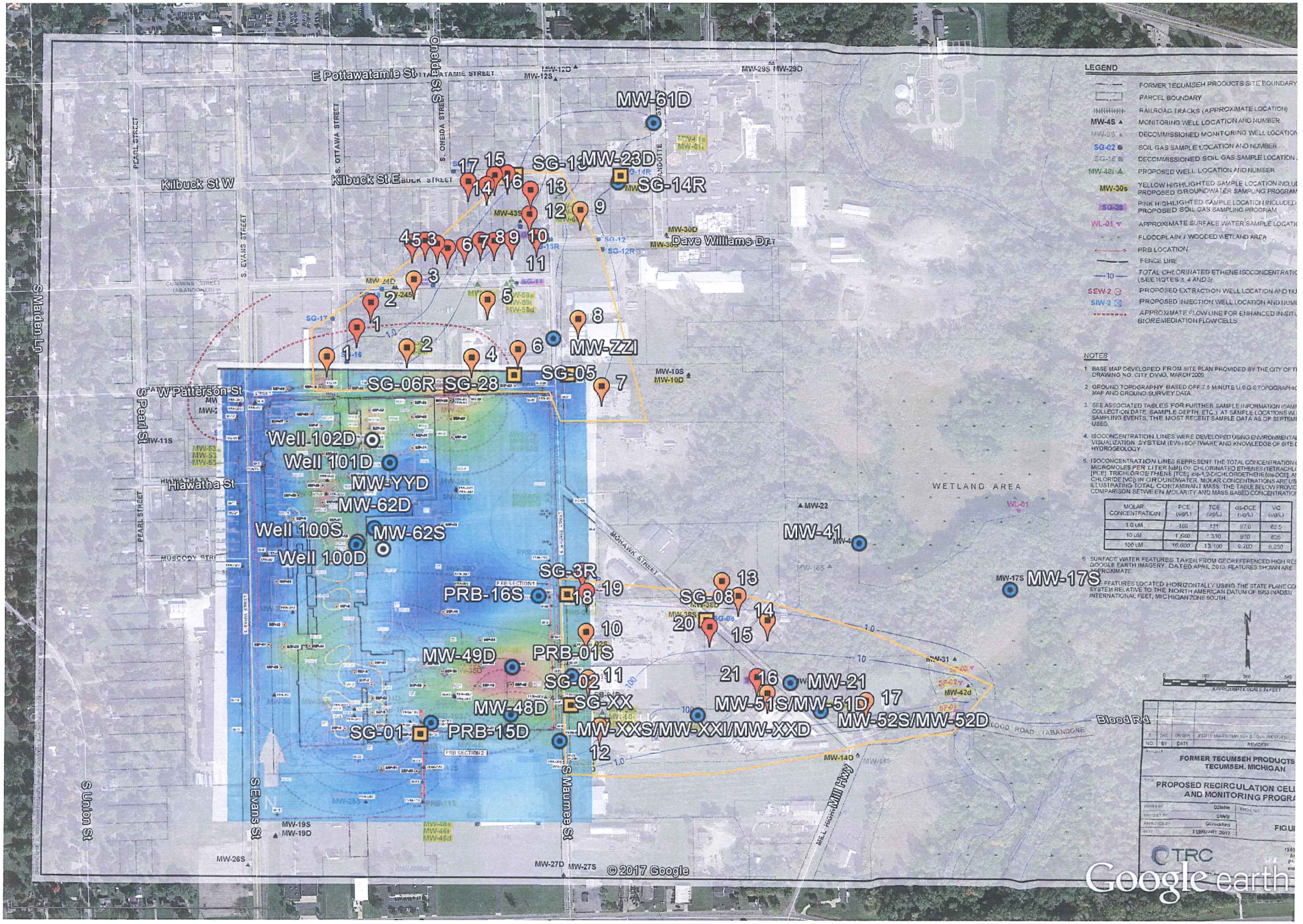
fax: (312) 697-2522
Please note our new mail code is LU-16J



Google Earth Pro

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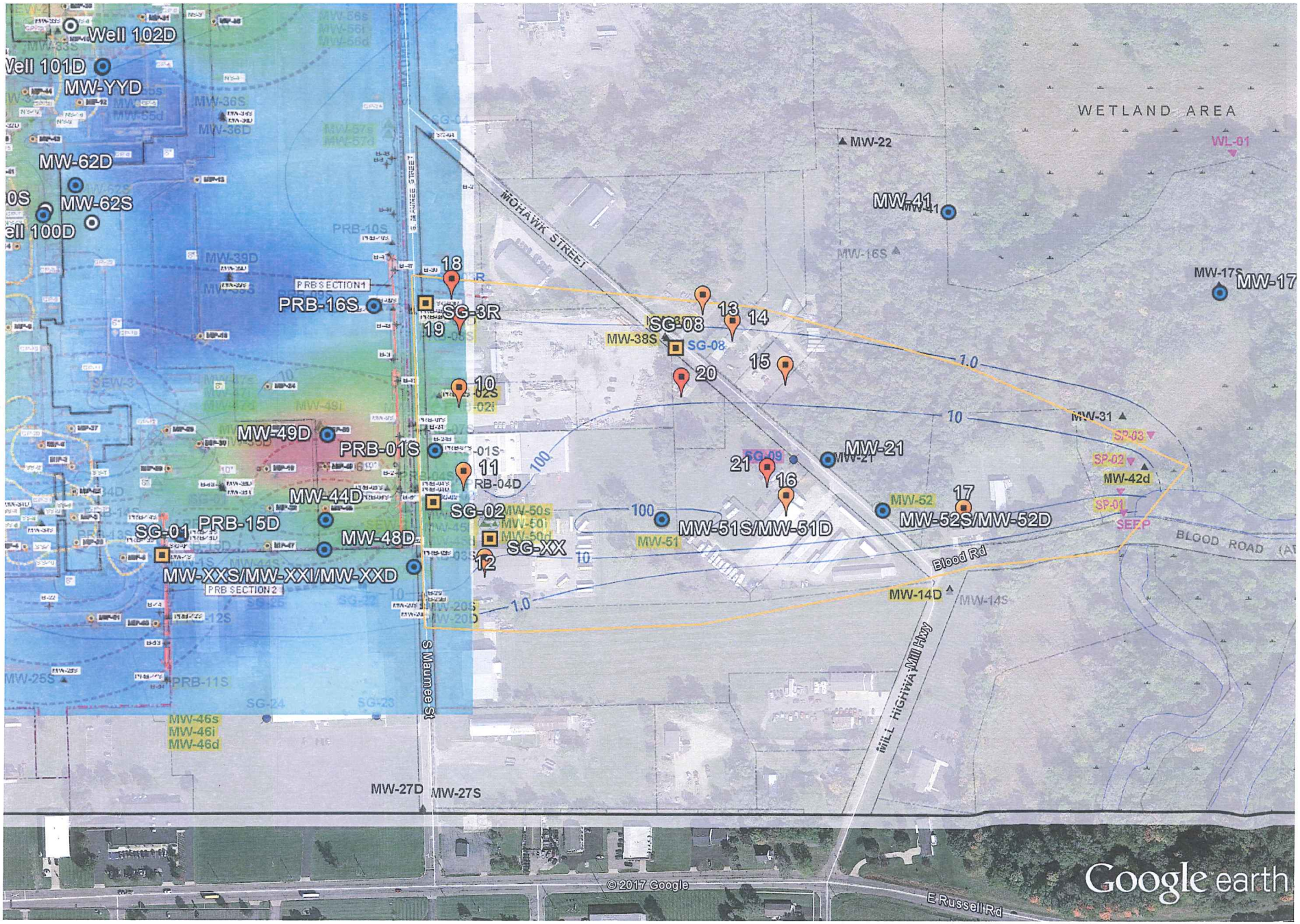

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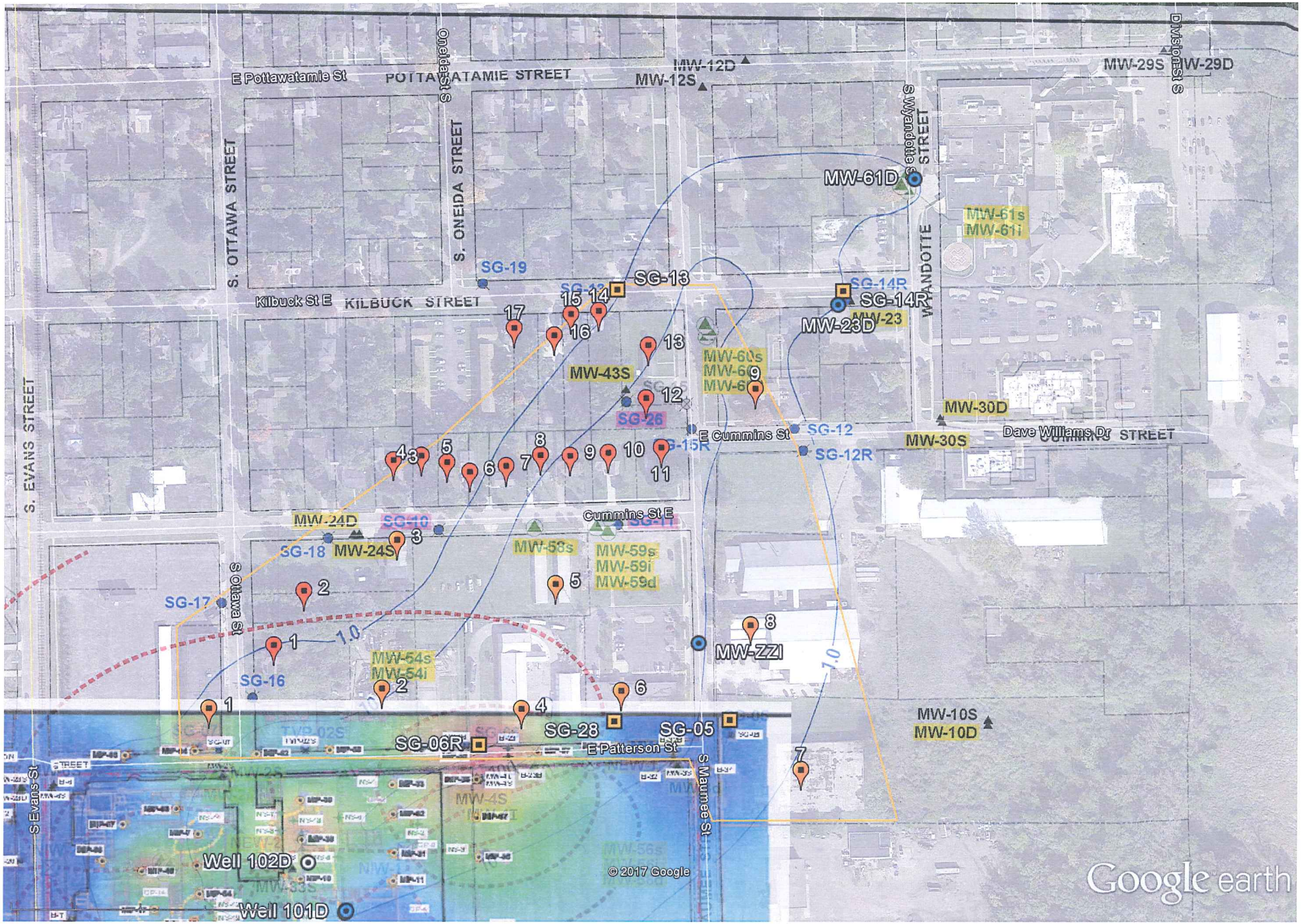

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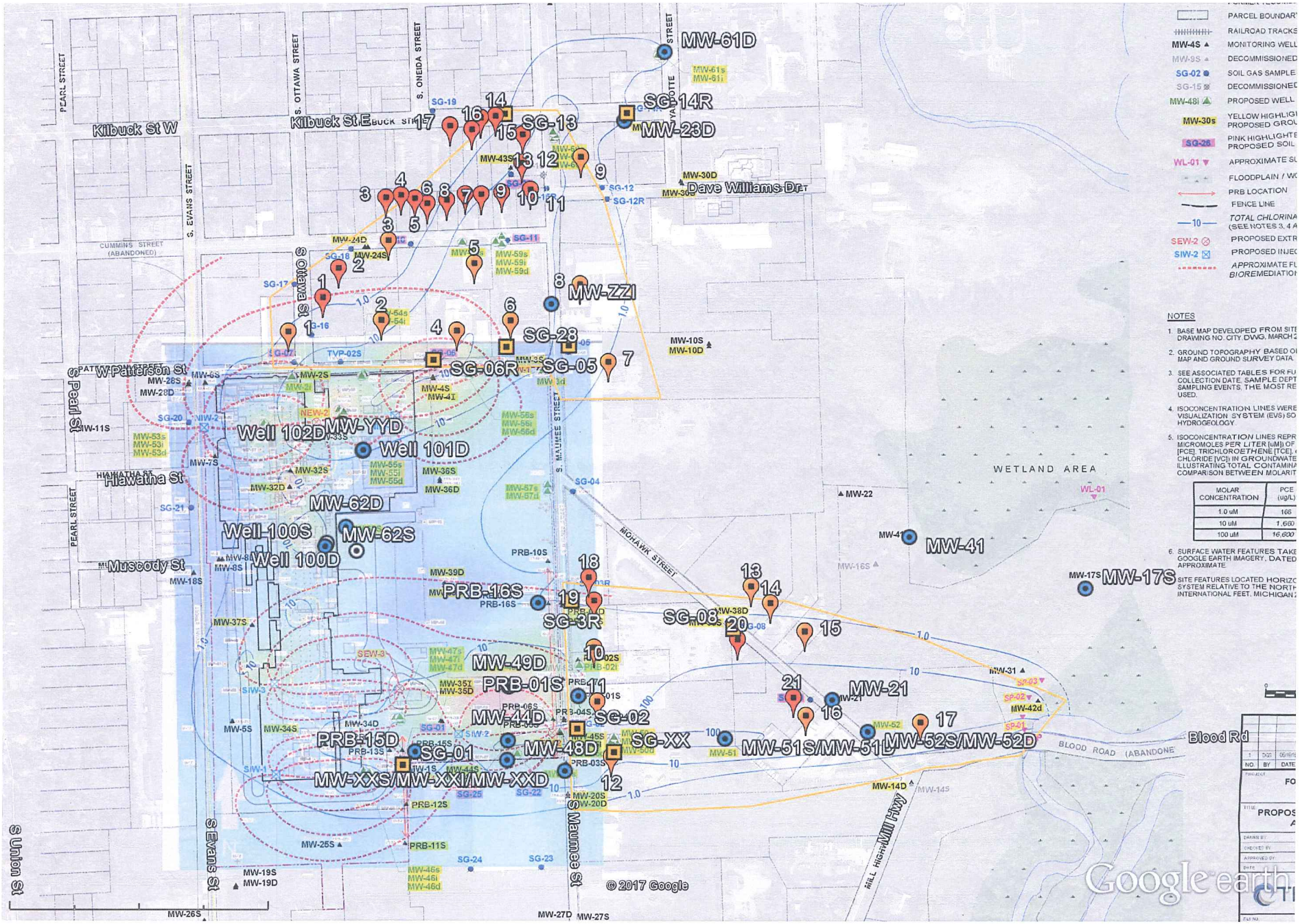

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Waste Management and Radiological Protection Division Remediation Advisory Team - Single Entry

Site: Tecumseh Products Company **District:** Jackson **County:** Lenawee

Review Type: Final RAP Review **Clean-up Type:** 201 Limited Non-Residential **Program:** Part 111 of 1994 P.A. 451

Meeting Date: 11/28/2017 **RA TEAM:** Kristen Kellock, Kimberly Tyson, Jim Arduin, Margie Ring, Joe Rogers, Ginny Himich, Sheryl Doxtader, Joe Kelly (EPA), Deb MacKenzie Taylor, Brett Coulter, Dave Slayton, Al Taylor, Jeff Hukill (RRD), Ray Govus (RRD), Holden Branch (RRD), TRC Representatives: Stacy Metz, Graham Crockford, Jason Smith (TPC)

Project Description: This is an EPA lead project. The former Tecumseh Products Company (TPC) site is located at 100 East Patterson Street in Tecumseh, Michigan. TPC is a 50 acre site adjacent to Raisin River. Flat topography until near river where it drops off ~20'.

TPC began manufacturing and storage operations at the site in 1934. Products manufactured by TPC included automotive parts, refrigeration systems, small tools, and toys. Manufacturing operations ceased by June 2008 and TPC operations focused on the production and reconditioning of compressors and condensing units for refrigeration and air conditioning units. During these processes, solvents composed primarily of trichloroethene (TCE) were used for parts degreasing.

In 2009, Phase 2 investigations identified chlorinated volatile organic compounds (CVOCs) in on-site soil and groundwater above Michigan Part 201 Cleanup Criteria. Contamination migrated off-site.

Project presentation given by TRC, consultants to TPC.

Notes:
1. Numerous phases of investigation activities conducted since 2010. Shallow clay layer divides shallow groundwater flow, both areas (north and south) flow east to Raisin River.
2. Depth to groundwater ~25' on western border and ~7' on eastern border; under building ~20'. Off-site have perched groundwater unit (clean) northeast of the site. Lower clay unit continuous across site (minimum thickness ~ 5') and deeper aquifer not impacted.
3. City of Tecumseh passed a local ordinance prohibiting groundwater use in area of contamination (irrespective of aquifer depth).
4. Pathway evaluation and formal risk assessment completed at site. Pathway evaluation was summarized in Charts 1, 2 & 3 of the presentation.
5. PCE and TCE main constituents of concern (COCs).
6. Two SVE systems currently installed for source control.
7. Permeable Reactive Barrier installed to treat groundwater.
8. PCE contaminated soil excavation conducted.
9. Onsite restrictions in place: non-residential land-use, no slab removal without replacement of a comparable barrier, vapor evaluation required for new buildings.
10. Summary of recommended corrective measures: institutional controls for groundwater, restrictive covenant, site vapor investigation to change land-use required, slabs to remain in place, two SVE systems, contaminated soil management plan.
11. Direct contact and drinking water protection pathway evaluation and corrective measures: groundwater use protection ordinance in place by city of Tecumseh. TRC confirmed that all wells at local residences were removed. The residences were hooked up to the city water system. TRC reported that the groundwater use ordinance was reviewed and approved by DEQ.
12. Vapor intrusion pathway evaluation and corrective measures: all residences in areas above Part 213 DEQ guidance screening criteria did indoor air sampling or installed mitigation systems or both. Twenty six soil gas monitoring points show exceedances at property boundary.
13. GSI pathway evaluation and corrective measures: One area (3 seeps, (seeps not waters of state)) above generic GSI criteria but below final acute values
14. TRC completed site specific risk assessment; calculated site specific clean-up levels for DW, GSI, and VI COCs.
15. Enhanced In-Situ Bioremediation also proposed (2 locations in northern portion of the building, 3

locations in southern portion of the building) to treat groundwater on-site as additional corrective measure.
16. TPC propose to continue groundwater treatment until off-site clean-up goals are met. They also propose groundwater monitoring to confirm no rebound is occurring.
17. Not certain if groundwater plume(s) are stable. Long-term monitoring and contingencies proposed in the Corrective Measures Study (CMS).

Recommendations:

1. Confirm off-site plumes are defined and stable.
2. Confirm DEQ approval of the city of Tecumseh groundwater ordinance.
3. Long-term performance monitoring for VI mitigation systems as well as contingencies for changing groundwater/soil gas concentrations that require additional VI investigation mitigation to be further refined; EPA/DEQ had comments on this issue in the CMS.
4. Evaluate VI (J&E) model predictive accuracy from groundwater to soil gas (not to indoor air which has been done) in areas where groundwater is sole VOC source. Recommend validation take into account difference in geology without building component.
5. Provide financial assurance adequate to cover all long-term monitoring activities (i.e. groundwater, VI mitigation, IC monitoring) and contingencies.

Chair's Signature: Kimberly M. Dyer **Date Signed:** 12/8/2017